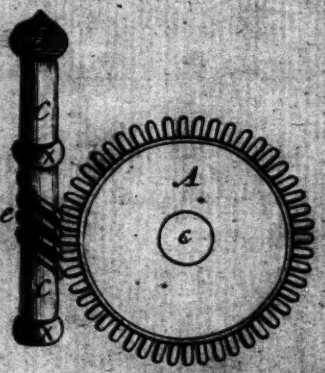
A Tonometer in Plano.

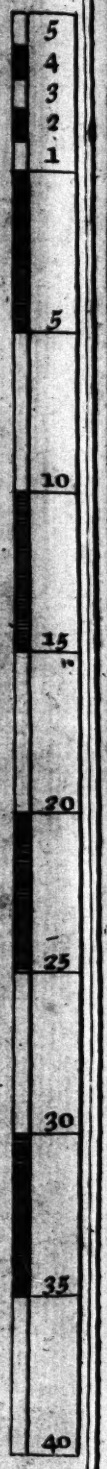


A A. The 2 Sides.
a a. The Bridge.
b b. The 2 tail Pins.
c c. The 2 Strings.
d d. The Nutt Bridge.
e e. { The 2 brass Pins for the Strings.
f f. The head of y^e Sector.
g g. { The 2 brass Wheels each 48 Teeth with a string Pin in the Center of each.

The depth is 4 Inches and a quarter.
N B. Both y^e Bridges are brass.

The Wheel Pin & Worm to their bigness.

A { The brass Wheel with 48 Teeth.
c { The Center & Head of the String Pin.
c c The endless Screw.
x x The 2 brass Collars.
e { The Worm of it turning the Wheel.
d { The Brass head thereof to turn by.



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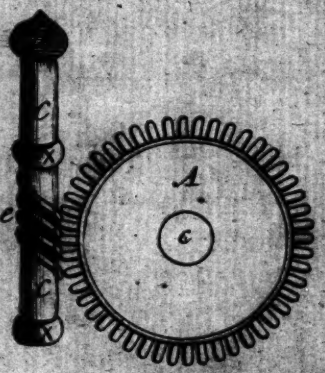

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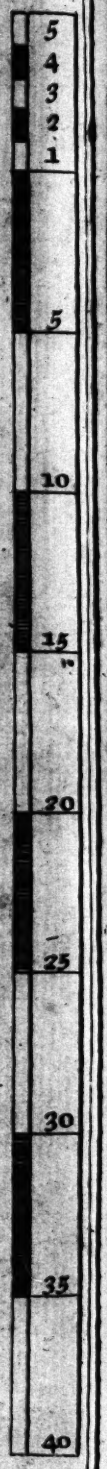

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THE TONOMETER:

Explaining and Demonſtrating, by an eaſie Method, in NUMBERS and PROPORTION,

All the 32 diſtinct and different

Notes, Adjuncts or Suppliments

Contained in

Each of Four OCTAVES incluſive, of the GAMUT, or COMMON SCALE of MUSICK.

With their exact Difference and Diſtance.

Whereby the Practitioner on any Key'd, or Fretted Inſtrument, may eaſily know how to Tune the ſame.

And alſo, with great exactneſs, how to Tranſpoſe any Muſick from one Key to another, Sharp or Flat, Higher or Lower;

With proper SHARPS or FLATS thereto.

Never before publiſhed.

By **Ambroſe Warren**, a Lover of MUSICK.

At the *Weſtminſter Printing-Office*, near *New Palace-Yard*,
Printed by *J. Cluer* and *Alex. Campbell*; and ſold by *B. Creake*, at the *Bible* in *Fermyn-ſtreet*, St. *James's*. 1725.

Sold alſo at the Printing-Office in *Bow* Church-Yard; at both which Places may be had the Firſt and Second Pocket Volume of Opera Songs; alſo the Opera's of *Julius Cæſar*, *Tamerlane* and *Rodelinda*, in Score and for the Flute: Likewiſe Muſical Cards, &c.

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MVSEVM BRITAN NICVM

With their exact Differences and Diſtances.

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Never before publiſhed.

By **Nimbole Guarten**, a Lover of MUSICK.

At the Weſtminſter Printing-Office, near New Palace-Yard,

Printed by J. Oliver and Alex. Campbell: and ſold by R. Cranke, at the Dial in Princes-ſtreet, St. James's. 1755.

Sold alſo at the Printing-Office in Bow Church-Yard; at both which Places may be had the Firſt and Second Pocket Volume of Opera Songs; alſo the Opera's of Judas Maccabæus, Alexander and Rodelinda, in Score and for the Flute: Likewiſe Muſical Cards, &c.

To the Right Honourable

James Hamilton, Lord *Paisley*,

Eldest Son of JAMES, Earl of *Abercorn*, in *North-Britain*, Viscount *Strabane*, in *Ireland*, &c. F.R.S.

May it please your LORDSHIP,

SOME time before I had finished the following Undertaking, an Ingenious Gentleman, and Lover of Harmony, Mr Beak, came to see my Instrument (which I I call a Tonometer) who, after his Examination and Approbation of it, was pleas'd to say, he believed your Lordship (whom he had the honour to know) would find some Entertainment by seeing it, and also might rectify any Errors which would probably be found in a Performance of so new and nice a Nature; for he knew no Person either more able to discern, or more ready to mend Faults, than your Lordship's known Skill, and experienc'd Benevolence enabled you to do.

This raised an ardent Desire in me to find out some proper way to lay it at your Lordship's Feet, when few Days after, Mr. Welby, another worthy Gentleman, known also to your Lordship, in a Discourse on a very different Subject, chanced to Name the Lord Paisley, and thereby offered too fair a

The Dedication.

Humble to be neglected, and by him I was in a little time after incouraged to open this small Enterprize to your Lordship; who was pleas'd to favour me soon after with the Liberty of presenting it to be corrected by your Lordship's great Judgment.

The very next Day after I had left it with your Lordship, I was in many Respects much surprized by your Expeditious Condescention, in bringing it your self to my House, and there in a most endearing manner, shewing me some Oversights and Errors in my Instrument, and its Appendages, and in my Performance also, by changing my Original fundamental Number 720 *(which in* 2 *upper* Octaves, *occasioned many Odd and Vulgar Fractions) to* 8000, *which produces fewer Fractions to any of the* 128 *Notes in the* 4 Octaves *Inclusive, and all Decimal ones, from Double C in the* Bass, *to* C *in* Alt; *for which, and other kind Hints, Helps, and Performances here, and elsewhere, the Musical Republick are indebted to your Lordship, and I in Particular more abundantly so, by the very Obliging and Condescending Treatment met with from your Lordship, by*

My LORD,

Your LORDSHIP's most Obliged,

And Dutiful Servant,

Aug. 9th. 1725.

Ambrose Warren.

To Mr. *Warren*,

The Ingenious Inventor of the

TONO-METRE.

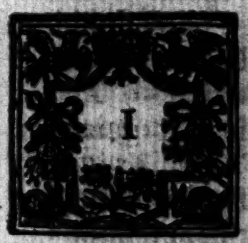
THOU happy'ſt Man of all Apollo's Sons,
Inſpir'd by *Numbers*, and inform'd by *Tones*:
Sure, at thy Birth, the *Spheres* perform'd their Parts,
And tun'd Thee Monarch of Harmonious Arts.
MUSICK reſerv'd (whate'er the Ancients knew)
Opens their inmoſt Privacies to You;
Who, for our Guide, the Compass firſt haſt found,
Thro' all the fluid Paths of undulating Sound:
The fleeting *Notes* anatomiz'd a-new,
To Points minuteſt, relatively true,
Arreſted volatile, are fix'd by You:
And to the Eye, as true as to the Ear,
Demonſtrated on your Machine appear.
But tho' you ſet the Limits unto *Sounds*,
Your Fame, unmeaſur'd, ſhall exceed all Bounds:
Numbers are only fit to touch on You,
And what Inſpires, Creates Your Poet too.

R. Palmer.

THE PREFACE.

To all Lovers of Harmony;

For to ſuch only I make this Humble ADDRESS, *ſince to all others it muſt appear but a Heap of unintelligible Jargon, neither diverting or profitable.*



Being born with a Muſical Genius and tolerable good Ear, but without any Opportunities to gratify or improve them: Above 50 Years ſince, being then about 19 Years old, I began to reſolve on doing both in ſome Degree, according to my ſmall Ability, in moſt Reſpects; and in order thereto, I conceiv'd that the *Flageolet*, then much in Vogue, was a very eaſy, cheap, chearful and portable Inſtrument to begin with; and after I had got a little Inſight of the Matter, I learn'd a bare Fortnight of Mr. *Opeter*, then a famous *French* Teacher, on *That* and the *Flute*, from whom I got a ſmall Smatch of *Tonguing*, then little

known to the many who played on either; and in some moderate Time I was reckoned no contemptible Proficient, performing readily any of the Musick then composed by Mr. *Banister*, Mr. *Staggins*, Mr. *Smith*, Mr. *Farmer*, &c. within the Compass of my Pipe: But I found that Instrument not copious enough for my Fancy, or so comfortable as I could wish.

Therefore I next resolved to take the *Flute* in hand, more adapted to Consort and Voice; and in a short Time, with the Help of a Book for stopping, and some friendly Assistance, I became a tolerable Proficient therein also; but I soon found some of the very same seeming Defects I had before observed in the *Flageolet*, namely an Imperfection and Deficiency in several Notes, which happened to be in several uncommon Keys, (where the Flats and Sharps were not the same) and I found not in due Tune, as in the more common Keys, or as they stood in the Scale called the *Gamut*: But to remedy these Defects and Dissonancies in some measure, I found that the various Application of the Fingers, and Alteration of the Wind, contributed no small Matter to helping these Defects; from whence I concluded that these different Tones were some intermediate Notes between two several Notes in the *Scale* or *Gamut*, and had different Tendencies and Relations, and which the best Masters on the *Violin* observed and performed more nicely, and in better Tune than the key'd or fretted Instruments did, or indeed could do.

Being now able to play a passable plain Part in Consort, I began to think the *Harpsicord* a more copious and compleat Instrument than my other two, and also a full Consort of three or more Parts in it self giving better Light to the Understanding of Composition, and those nice Degrees I had for so long Time been harping privately on.

Some time after I bought a two-stopt *Harpsicord*, but before I could make any Progress therein, more than knowing the Keys, and something how to *Penn*, *Bristle*, *Cloath*, *Tune*, &c. I was call'd into *Oxfordshire*, and there, without any Help more than occasionally going to *Oxford*, 9 Miles, and conversing with some of the Masters and Performers there, I gain'd a little Knowledge in my *Harpsichord*, which being neither new, or good, exercised me much more in Keeping and Tuneing, than Performing, my Head and Ears being far better for the one, than my Hand for the other.

However, by this Means my Opinion about other than bare 13 *Tones* or *Notes* in an *Octave* inclusive, strengthned; but I had not Courage enough to impart these my Notions to any as yet.

In

In some farther Time my Lott fell in *Wiltshire*, 6 or 7 Miles from *Salisbury*, where I now and then went on Business, and where I became acquainted with Mr. *Michael Wise*, the then Organist, by whom I gained some Experience on the *Keys*, and soon had an *Organ* put into my Hand, giving me a better View of Musick.

After some Time more, I was called into *Herefordshire*, about 9 Miles from that City, where I frequently convers'd with Mr. *Henry Hall* the Organist, &c. to my farther Improvement of Skill.

About the Year 1683 I went to *Ireland*, and at *Dublin* was soon acquainted with Mr. *George*, Mr. *Thomas*, and Mr. *Charles Tollet* and other Masters, with Mr. *Godfrey* the Organist, and then with some of the Principals of the *Theatre*, who prevailed on me to introduce *Flutes* for their Stage, never before done.

Becoming thus intimate with the Messrs. *Tollets*, they soon confirm'd me in my former Notion of the Deficiency of Key'd or Fretted Instruments, as also of the *Gamut Scale*, and Authors relating to the same, about those intermediate Notes.

Returning into *England*, and in some Time after to *London*, it was my greatest Happiness (by a very good Accident, conducive to the happy Revolution, by the Interposition of Dr. *Sharp*, Rector of St. *Giles*, afterwards Lord Arch-bishop of *York*) to be known to Dr. *Tenison*, then Vicar of St. *Martin's*, and Rector of St. *James's*, afterwards Lord Arch-bishop of *Canterbury*; who, at the building of his Tabernacle in *King-street*, *Golden-Square*, and erecting a Free-School there and at St. *Martin's* Library, appointed me a Master in both of them; and, in some time after, an Officer at St. *James's* Church also.

I still kept my Mind much more than my Hands on *Musick*, and at my aforesaid Return to *London*, found my self more establish'd in my aforesaid Notion about Notes, by divers *Harpsichords* and *Spinnets*, made by Mr. *Player* and others, with split Keys, as they were call'd, being some of the short Keys divided with proper distinct Jacks, Pins, Strings, &c. to express some few of those very intermediate Notes which I now am to account for, and which they thought the most material to be chosen.

But tho' this Expedient was so reasonable and just, and answer'd the End it was intended for, in respect of those few Notes, yet the fingering of the Keys, and Trouble of Tuneing them right, proved such a Difficulty to the Performer and Tuner, that the Matter was not much countenanc'd, or generally receiv'd, so that it has been long discontinued; yet this, in a good measure, corroborated much of what I shall advance about the *Scale* or *Gamut* in the following Treatise on that Subject.

To proceed; about the Year 1707, when Father *Smith* the Organ builder died, I was, by the Honourable Veſtry of St. *James*'s Pariſh, choſen to keep their *Organ* in Tune and Order in his Stead, which I found to be in a very mean Condition in many Reſpects: And in 1708 I was, by the ſame Authority, order'd to reform divers Stops, and put in ſeveral new ones, which I, with Help, perform'd, to the full Satisfaction of all concern'd, as well as my ſelf. Theſe Operations, with the Help I received by Three ſeveral *Organs*, which I new Framed, fitted up, and ſold in the Compaſs of Three or Four Years following, and the keeping of St. *James*'s Church *Organ*, and that of *King-ſtreet* Chapel in Tune and Order (as I ſtill do) gave me many fair Opportunities of examining, with Nicety, my aforeſaid Notion of theſe intermediate Notes; and coming to a Determination what, and how many they were, and where they ought to be placed; and alſo to find a Method how to aſſign certain, or very near, Proportions to each Note, as well thoſe not ſo commonly taught, as the other eſtabliſh'd Notes of the *Scale* or *Gamut*, from the loweſt to the higheſt therein, conſiſting of Four *Octaves*, incluſive from double *C* to *C* in *Alt*.

And having by me a true Copy of the Honourable *Francis Roberts*, Eſq; his excellent Diſcourſe, Experiments, and Tables on the *Trumpet-Marine*, and *Trumpet* Notes, I took his Number of 720 for my Scale, alſo his Method for my Operation, and about Six Years ſince communicated this my intended Deſign to my ingenious and modeſt Friend Mr. *Conteville*, a known and able Maſter of Muſick, as well as of many other Things out of his Profeſſion; but ſome Buſineſs happening ſoon after I had begun, made me lay it aſide for that preſent; and dormant it lay, until a late Performance on the Subject of Harmony (nothing new, but well digeſted) came forth and revived my former Intention.

In order to proſecute which, I drew a Plan of a proper Inſtrument, had it made by an able Workman; and after divers Trials of Strings, Pins, *&c.* ſtrung it with Two Wire Strings of the ſame Roll, with Three moving Bridges, and the Strings to be wound up with Two fine endleſs Screw-Pins to the utmoſt Nicety of tuneing to any Chord, or Pitch; then I ſet it to my Two Stopp'd *Harpſichord*, One Stop of which Tuned the common Scale way the exacteſt I could, the other Stop tuned according to the Nineteen Notes; Flats or Sharps I wanted more particularly to explain at my firſt ſetting forth.

By the Help of all theſe duly prepared, with an exact broad *Diagonal* Scale of 720 Parts, the Length of my Inſtrument Two Foot, Nine Inches, and a Quarter, from the *Nut* to the fixed *Bridge*; which may be call'd a *Monometer*, and with a Pair of fine large *Compaſſes*, which would extend to Twenty

or

or Twenty One Inches, without most Nicety. Thus furnish'd, I was enabled to examine and compare every *Note*, not only upon my *Tonometer*, but also with one or other *Stop* of the *Harpsichord*, not much regarding my *Pitch-Pipe*; and thus, with great Care, I proceeded to take the exactest Number and Proportion I could, from the *Nut* to the several Two small moving *Bridges*, up from the fix'd lower *Bridge* at double C, 720, taking each Note of the Thirteen inclusive, in an *Octave* of the common *Scale* or *Gamut*, as well as the other Nineteen intermediate *Notes*, *Adjuncts*, or *Suppliments* of the lower *Octave*, up to C, 360, (in the exact Middle of my *Tonometer*) being the *Octave* above double C, 720, at the lower *Bridge*.

To find the Notes in the upper Three *Octaves*, up to *C* in *Alt*, had not much Difficulty in it (as every Experimenter of like sort knows from such a Foundation) besides the halving the lower *Octave* to each *Note*, and so up to the Top.

I am neither so vain, or hardy to affirm I have found and given the very precise Number to One or Two Tenth Parts of the 1000 in the now upper *Octave* to every *Note* or *Adjunct*, but leave it to any Person of more Sagacity, Youth, Leisure, and other Abilities, to improve; and, by better Ways, to rectify any small Errors that, on nicer Examination, may appear in this first Attempt to explain the *Scale* or *Gamut* so fully.

It is both just and necessary that I should here own the many and great Helps I most gladly and gratefully receiv'd by and from a Person of Honour, by changing my intended Foundation Number 720 to 8000; and having a *Scale* made for the *Bridges* to move on each Side, saving thereby much Trouble and Time, and preventing all Uncertainty by my *Compasses* and other *Scale*; besides many other greater Improvements appearing in the Prosecution of this *Essay*.

All that I have aim'd at in this whole Undertaking has been only to break the Ice, and open the Way for some other more judicious and dexterous Performer; and I shall Love and Honour the Person who shall make the smallest Correction or Improvement in either the Matter or Manner of this Enterprize

Of my Musical and Candid Friends

Most Faithful and Humble Servant,

Thomas Court,
August 10. 1725.

AMBROSE WARREN.

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On the GAMUT, *&c.*

THE meaneſt Pretender to the Science or Profeſſion of *MUSICK*, knows the common *Scale* or *Gamut* is accounted to conſiſt of Seven Notes, call'd *Prime*, or *Chief Notes*; as, A, B, C, D, E, F, G; and alſo Five other *Supplimental* Ones, call'd *half Notes*, or *Flats* and *Sharps*; being, in all, Thirteen diſtinct and different *Tones* or *Notes*, in every compleat *Octave* incluſive; and ſo repeated upward or downward as far as the Voice or Inſtrument can reach, or Occaſion requires, without any Notice or Intimation of any other *Tones* or *Notes* whatſoever, that can ariſe from the Foundation of this *Gamut*.

AND this paſſes for *Orthodox* and unqueſtionable *Doctrine* with ſome who have too often appear'd in Print as Teachers, and by ſome Perſons of conſiderable Figure and Learning, more than ſufficient for the Work, had they had *Muſick-practice* and Skill enough, with good Ears, and due Attention, to have made a nicer Scrutiny into, and ſerious Judgment of harmonical Relation.

BUT I am very certain, That every ſound and practical Muſician, who hath duly conſider'd the common Scale of Thirteen Notes in an *Octave*, incluſive as aboveſaid, and thoſe Notes on a well tuned *Organ*, *Harpſichord*, *Spinnet*, or other like Key'd Inſtrument; or the *Viol*, *Lute*, *Guitar*, or other like fretted Inſtrument of Thirteen to an *Octave* incluſive, and examin'd them ſtrictly by divers excellent Compoſitions of the beſt Maſters, in Variety of Keys, will agree and confeſs, That thoſe Inſtruments, ſo tuned, cannot expreſs

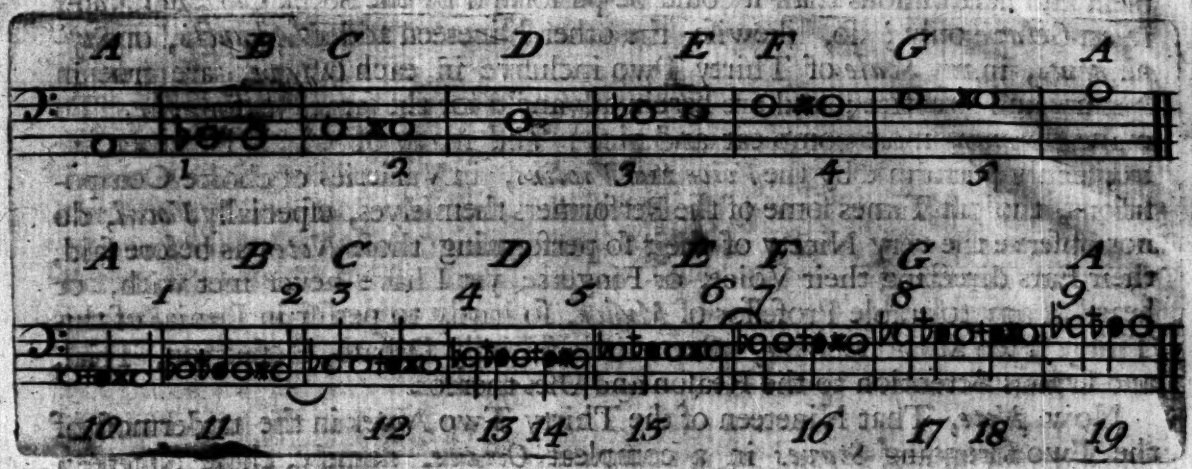
in Tune ſeveral Tones, or Notes, that frequently occur in many ſuch Compoſitions, where there are curious *Tranſitions*, ſmooth, cromatick *Aſcents* and *Deſcents*, with delightful and quaint Cloſes in many Keys.

To help the Defects, of this Kind, in the *Scale*, ſome ingenious Shifts have been invented; as, by dividing ſome of the Keys of a *Harpſichord*, &c. by adding regulating Stops in an *Organ*, ſhifting the Frets of the *Lute*, *Viol*, &c. but none of theſe have been ſufficient to anſwer the full Demand; or can be made to do it without much Difficulty and Perplexity.

The compleat Maſters of *Vocal Muſick*, and thoſe of the *Violin*, (an Open, Noble, Generous, and Free Inſtrument, not cramp'd, fetter'd, or confin'd with Fret-work) know and own, That all thoſe Key'd or Fretted Inſtruments, according to the *Scale* of Thirteen Notes in an *Octave* incluſive, cannot perform divers Notes in Tune, as they do on the *Violin*; but are, in many *Paſſages*, *Cadences*, and *Cloſes*, either too *ſharp* or too *flat*, either in their *2ds*, *3ds*, *4ths*, *5ths*, *6ths*, or *7ths*, of one ſort or other.

Every Performer on the aboveſaid Key'd or Fretted Inſtruments, muſt own, that he often has, and may have, Occaſion to make *Cadences* and *Cloſes* in any of the Eleven Intermediate Notes of the Thirteen in the common *Scale*, which he does as well as he can, by concealing from the Hearer the Deficiencies of ſeveral Notes he can't touch in juſt Tune; they may, indeed, put any ſuch Key'd or Fretted Inſtrument into very good Tune and Order, for any one fix'd or certain Key in the *Octave*, whether with *flat* or *ſharp 3ds*, &c. but then it's confin'd to that Key chiefly.

But ſome of theſe Performers are not appriz'd of a very certain Truth in Muſick; which is, That every *Key*, *Fret*, *Tone*, *Note*, or *half Note* (as falſly call'd) ſo fretted or divided, according to the common Scale, frequently requires a true *2d*, *3d*, *4th*, *5th*, *6th*, and *7th*, of the one or other ſort, *Major* or *Minor*; in many good Compoſitions and Varieties of Muſick, which his Inſtrument is not provided to perform perfectly, but to provide for all theſe Demands, and compleat the common *Scale*: Inſtead of Thirteen Notes and half Notes (as erroneouſly call'd) there really is, and ought to be, Thirty Two diſtinct and different Degrees of *Notes*, *Adjuncts*, or *Suppliments*, in the ſame Compaſs of every *Octave* incluſive; as in the following undermoſt Scheme: But firſt, the common *Scale* of Thirteen in an *Octave* incluſive, is as immediately follows.



Here above, is an *Octave* of the *Gamut*, or common *Scale*; wherein I take the Liberty to call those Seven, A, B, C, D, E, F, G, (over which those Seven Letters stand) by the Name of *Primes*, or *Cardinal Notes* of an *Octave*: As I also do to call those other Five Notes (under which 1, 2, 3, 4, 5, are placed) *Adjuncts*, or *Suppliments* to Five of those *Primes*, or *Cardinal Notes*, to which they properly belong, and by which they are severally denominated, as, B *Flat* ♭, C *Sharp* ♯, E *Flat* ♭, F *Sharp* ♯, G *Sharp* ♯.

If there be any other fitter Name to give to either sort, I agree most readily, bare Names being empty Things; but, I think, some such like Distinction should be allow'd for them Five; or other more minute Dissections of the *Scale*, as well as those now made use of, as B *Flat*, C *Sharp*, E *Flat*, F *Sharp*, and G *Sharp*, which Five are but as *Adjuncts*, or *Suppliments* to those Five of the Seven *Cardinals*, whose Names they bear, and are for the more Copious and Harmonious Performance of *Musick*; and this, I hope, will be taken for a tolerable *Apology* or *Excuse*, in Answer to an Objection that may be made, *viz.* Why I give Names to the Nineteen Additional Notes in my *Scale*, which are not any of the Seven *Principal*, *Prime*, or *Cardinal Notes* thereof; and also for the other Seven Notes in the same *Scale*, which I call *Principal*, *Prime*, or *Cardinal Notes*.

And having thus answer'd a probable Objection to be made thereto, and thereby, I conceive, in a good Measure, satisfied any reasonable Reader or Performer, or Pretender to the Science of *Musick*; that as the Five *Flats* and *Sharps* in the common *Scale*, are constituted to render *Musick* more com-

 pleat

pleat and harmonious than it could be perform'd by the Seven *Cardinal Notes* in an *Octave* only; ſo, likewiſe, the other Nineteen added *Adjuncts*, or *Supplements*, in my *Scale* of Thirty Two incluſive in each *Octave*, are true in Nature and Practice; and are herein advanc'd for the ſame Reaſon, *i. e.* To make *Harmony* more compleat and nice; and many of which Nineteen are frequently perform'd by the *Voice* and *Violins*, in Varieties of choice Compoſitions, tho' oft Times ſome of the Performers themſelves, eſpecially *Vocal*, do not obſerve the very Nicety of their ſo performing thoſe *Notes*, as before ſaid, their Ears directing their Voice, or Fingers; yet I have never met with, or heard of any tolerable Profeſſor of *Muſick*, ſo hardy to perſiſt in Denial of this Thirty Two *Scale Doctrine*, after a little friendly Debate, Reflection, Trial, and ſerious Attention to the Reaſon and Uſes thereof.

Now *Note*, That Nineteen of the Thirty Two *Notes* in the undermoſt of the Two foregoing *Staves* in a compleat *Octave*, namely, thoſe Nineteen which ſtand diſtinguiſh'd by a *Minum* 𝅗𝅥, or *Crotchet* ♩, cannot be tuneably expreſs'd to the Satisfaction of a tolerable Ear, by any ſuch Key'd or Fretted Inſtrument, put in the beſt common Order; or if tuned to ſome One or more of thoſe Nineteen, yet ſome other Nineteen of the Thirty Two muſt be put out of Tune, and defective; ſo that ſome Nineteen of the Thirty Two in every ſuch *Octave* will oft be wanting in ſuch Inſtruments, to join in Conſort, and make perfect Harmony.

Had I choſe any other *Note* in the *Scale* for this Scheme of Thirty Two, the Caſe and Concluſion had been the very ſame; but this I here exhibit, as beginning with *A*, and being within the Compaſs of Five Lines in the *Baſs Cliff*.

I hope none will conclude from what I have hitherto advanced, that I depreciate and diſlike the common *Scale* of Thirteen, before exhibited, and ſo generally uſed; which I think a very juſt and ſound Foundation and Introduction, fit to be continued, not to be mended in that ſmall Compaſs of Thirteen *Notes*: Indeed, Teachers in private, or by Publication in Print, may do well to inform that there are ſome other Branches ſprouting from this Body of Thirteen, on various Occaſions in the thorough Practice of *Muſick*, which proportionally differ both in Degree and Relation, as much as any of the Five *Sharps*, or *Flats* in the *Gamut* do from their reſpective *Primes*, or *Cardinal Notes*; ſtill keeping to the *Gamut*, as the beſt Ground-work and Foundation.

Divers *Engliſh* Authors have ſpent much Time and Labour in collecting from the ancient *Greeks* and *Latins*, &c. *Notes*, *Tables*, and *Schemes* on the Subject of the *Gamut* and *Harmony*, and exhibited many *Rations*, *Proportions*, *Relations*,

Relations, with *Denominations* of *Tones*, *Notes*, and *Degrees*, aſcending and deſcending; ſome of which not underſtood, others not to be diſcern'd, and ſome in Practice not true.

But none of them, to far as I am able to judge, have yet open'd ſo good a Way to the true Diviſion of an *Octave* as the Honourable *Francis Roberts*, Eſq; in his moſt ingenious Experiments, Obſervations, Diſcourſe, and Tables on the *Trumpet-Marine*, and *Trumpet-Notes*, by the Diviſion of a *Monochord*, or one *String* (in Philoſophical Tranſactions N° 195) by which he moſt rationally diſcover'd the Reaſon of the few *Trumpet Notes*, as well perfect as imperfect; all very reaſonable and juſt, without any undiſcernable Terms of *Comma Schiſm*, *Tone-Major* and *Minor*, or *Semi-tone*, *Major*, *Minor*, *Minums*, not found in the Practice of Muſick by the beſt Performer's Ear or Judgments I have yet met with.

I ſhall proceed and follow ſo ingenious a Leader, and ſhew not only what Number of Parts are contain'd in an *Octave* incluſive, but alſo, what Number of equal Parts each *Diviſion*, *Tone*, or *Note*, therein conſiſteth of, and conſequently how many of the ſame Parts each differs from its next. In the lower of the Two preceding *Staves* of the *Gamut*, I have advanc'd ſomewhat like a new Notion; and, on good Grounds, I doubt not to maintain, That (ſtill taking the common *Scale* for my Foundation) there are to each of the Seven *Prime* or *Cardinal Notes* thereof, *viz. A*, *B*, *C*, *D*, *E*, *F*, *G*, Two, Three, or more *Tones*, *Notes*, *Adjuncts*, or *Suppliments* belonging. The common *Scale*, *Organs*, *Harpſichords*, *Spinnets*, &c. have but Five, namely, *B* ♭, *C* ♯, *E* ♭, *F* ♯, and *G* ♯, which do not, cannot accommodate all the Seven *Primes*, or *Cardinal Notes*, with true *2ds*, *3ds*, *4ths*, *5ths*, *6ths*, and *7ths Minor* and *Major*, &c. as this of Thirty Two moſt exactly doth: And this was the Reaſon for making ſome ſuch Inſtruments with ſplit Keys, (as hinted in the *Preface*) in order to anſwer ſuch of the Nineteen additional *Adjuncts* I have here introduc'd, which they conceiv'd were the moſt and oftenеſt wanted.

It muſt be own'd, That all juſt Performers by the *Voice* or on the *Violin*, do always, on all Occaſions, Sing, or Stop according to this Doctrine of Thirty Two; tho' ſome of them, for want of due Notice and Attention, do not fully obſerve it, their Ears ſtill directing them to Sing or Play nicely in Tune, tho' not exactly as the *Note* or *Notes* ſtand in the Paper, but ſome a little flatter, and ſome a little ſharper.

But then any ſuch Singer or Player, with little Attention and Argument, are ſoon brought to confeſs their Inadvertancy, and own they plainly hear and find the Deficiency of thoſe Fretted or Key'd Inſtruments, Fram'd and Tun'd

according to the common Scale of only 13 in an *Octave* inclusive; and that they do indeed ſing or play according to this of 32, as Occaſion requires.

I doubt not but on a juſt Examination it will be found plain and true in this *Scale* of 32, (where each of the 7 *Cardinal Notes*, *A*, *B*, *C*, *D*, *E*, *F*, *G*, have their 2, 3, or more reſpective *Adjuncts*, or *Supplements*, ſome flatter, others ſharper) that there are the like Proportional *Differences* between thoſe *Adjuncts* and their reſpective *Cardinals*, namely that the ſame Proportion that *F b* and *F* ✻ bear to *F* their *Prime* or *Cardinal*, ſuch Proportion do *G b* and *G* ✻ bear to *G* their *Prime* or *Cardinal*; and the like of all the reſt of the 7 *Cardinal Notes*, even *B* and *E*.

All good Performers of *Thorough-Baſs* agree, that a true *Sharp* 3d, and 6th, with many other Relations are moſt frequently required and neceſſary to the ſeveral *Keys*, in *Cromatick* Paſſings up or down, clean *Tranſitions*, *Cadences* and *Cloſes*, many of which cannot be truly expreſs'd in the limited 13 in an *Octave*; but all which are moſt perfectly provided for in this of 32, as muſt plainly appear on a little Examination; for herein is ample Proviſion made for all 2ds, 3ds, 4ths, 5ths, *&c.* *Minor* and *Major* in all *Keys*; many whereof are wanting likewiſe in the *Octave* but of 13.

What has been hitherto advanced may juſtly ſeem to impeach the Doctrine of thoſe learned Authors, as well Natives as Foreigners, who with more *Philoſophy*, *Mathematicks*, and *Imagination*, than through *Practice* or *Skill*, or good Ears, for *Muſick*, have publiſhed the Notion of a Greater and Leſſer *Tone*, three ſorts of *Semitones*, as *Major*, *Minor*, *Minimus*, &c. which every able and impartial Examiner will find to be erroneous, if he Tranſpoſe any Piece of *Muſick* from any one *Key* to another of the ſame Species, as from *F* to *G*, from *G* to *A*, from *A* to *B b*, from *B b* to *C*, or from *C* to *D*, *&c.* each with a 3d *Major*, when he will ſtill find it the ſame thing; or again Tranſpoſe another Piece with a 3d *Minor*, from *G* to *A*, from *A* to *C*, from *C* to *D*, *&c.* with a flat 3d each, and the *Muſick* in both theſe Caſes will be the ſame to his Ear and Judgment, whether alone, or in Conſort; whereas had the Aſſertion of a greater or leſſer *Tone*, or whole *Note*, or of a greater, leſſer, and leaſt *Half-Note* been true, theſe *Tranſpoſitions* wou'd not have proved true and exact in many Places, but offended the Ear, and given a different *Air* of the ſame *Muſick* in one *Key*, to what it had in another of the ſame Species.

But this generally exploded Doctrine, implies more than the Countenancers thereof ever intended; that is to ſay, to affirm in Conſequence, that there are more than two ſorts of *Thirds*, namely two or more *ſharp*, and

two

Two, or more, *flat* Thirds; which is not true, but abſurd, in my humble Opinion, and, indeed, in the very Opinion of the Advancers thereof; for they themſelves, in flat Contradiction to themſelves, in this Point, expreſsly and fairly teach the Truth about Thirds, namely, That there are but Two in all, *viz.* a *ſharp* Third, and a *flat* Third, in any Key whatſoever.

It may not be improper here, to rectify ſome few Errors, hinted at only in Page 15, about *Tones*, and *Semitones*, ſince ſome Authors have taught with more Aſſurance than Ground, That there are, Firſt, Two Sorts of whole *Tones*, *Major* and *Minor*; and, Secondly, That there are Three Sorts of *Semitones*, *Major*, *Minor*, and *Minums*.

Whereas, in Fact, there is in Harmony but One Sort of whole *Tone*, and next, there is no ſuch Thing, properly ſpeaking, as *Semitone*, but that every whole *Tone*, as from *F* to *G*, from *G* to *A*, from *A* to *B*, from *B* to *C* ♯, from *D* to *E*, from *E* to *F* ♯, *&c.* are all equally whole *Tones* alike, and each next Two bear like proportional Differences harmonically, having Two, Three, or Four intermediate different *Notes*, *Adjuncts*, or *Supplements* between them: As ſuppoſing *C* and *D* for Inſtance, *be* 32.88 equal Parts; then from *C* to *C* ♯ 11.05, from *C* ♯ to *C* ♯♯ 10.81, from *C* ♯♯ to *D* ♭, 10.57, from *D* ♭ to *D* ♮ 10.34, from *D* ♮ to *D* 10.11.

The ſame or ſimular proportion'd Differences are truly between any other Two next whole *Tones* or *Notes* whatſoever; or otherwiſe, to keep yet nearer to the *Gamut* of Thirteen in the Diviſion of a whole *Tone*, from *C* to *C* ♯ 21.86. from *C* ♯ to *D* ♭ 10.57, from *D* ♭ to *D* 20.45, from whence it's plain there is no ſuch Diſtinction in true Harmony as *Major* and *Minor* whole *Tone*; and, indeed, no *Semitone* at all, for the neareſt Muſical Diviſion of a whole *Tone* being a Fifth Part thereof, or Five *Quints* of a *Tone* nearly, by a *Scale* of equal Parts; but in harmonical Parts more nicely, juſt, and equal, for the nearer the *Bridge*, the leſs are the equal *Parts* or *Numbers*; tho' in harmonical Parts, Proportions, or Relations of the ſame Kind, or Diſtance, they are all exactly equal.

A Queſtion being put to me lately by a good Mathematician and Philoſopher, but no Muſician, (and before an eminent Maſter of Muſick and Compoſer) How it came to paſs that this Doctrine of the *Gamut* or *Muſick-Scale* of 32 in an *Octave* incluſive, ſhould never appear in any Degree, as to *Number* and diſtinct *Proportions*, until this Time, and by me, and my Means?

To which the Subſtance of my immediate Anſwer was, That very probably the Mathematick *Philoſophers* and *Theoriſts*, who had formerly written the Subject of the *Gamut*, were no practical Men in *Muſick*, and alſo lay under this Diſadvantage, namely, not to have any common Inſtruments of *Muſick* in any Meaſure fit to examine the Caſe duly by, their Inſtruments being either

fretted or key'd; and their Wind Inſtruments fram'd accordingly; ſo none that could proceed in that nice and gradual Order from one *Note* to another, up or down, until the *Violin* was bro't to the Perfection it now is at, to examine the *Gradations* by: And that ſtill, generally ſpeaking, the preſent Performers have not been qualified, with ſufficient Knowledge in *Numbers*, *Lines*, &c. or with Courage enough, to make nicer Calculations, or advance more Steps in improving of the Authors foregoing, than in ſome few *Notes* as occaſionally, *D* ♯, *E* ♯, *G b*, *A b*, *A* ♯, and *B* ♯; but took the *Scale* as they found it, unleſs in theſe few Additions on Occaſion. And this was more lately confirm'd to me by another excellent Performer on, and Maſter of the *Violin*, Mr. *J. B.* who diſcourſing on this Point, confeſs'd, That tho' he, as many others, could perform any Piece of *Muſick* moſt readily at Sight, in any *Key*, but knew not how to aſſign any Proportion to, or of any *Note*, or *Gradation*, &c. for want of Skill in *Numbers*, *Lines*, &c. adding, That it requir'd ſuch a Perſon who was withall a Performer, with nice Ears, and a critical Obſerver, to be capable to enter on, and go thro' ſuch a nice Scrutiny of the *Gamut*, as we were then ſpeaking of.

Mr. *Simpſon*, in his *Compendium*, printed 1667, Page 107, 108, 109, gives a good Explanation of an *Octave* in the Thirteenth *Scale*, and gives Hints of Leſſer and Greater *Semitones*, (improperly ſo call'd) as does many Authors; particularly Dr. *Holder*, in his Tables of ſuch an *Octave*, variated Four Ways, Page 155; but neither they, or any other I have met with, or heard of, has given any juſt Idea of thoſe *Notes*; as namely, what Number of equal Parts the one is greater or leſs than the other; or, indeed, what Number of like Parts are between any Two *Notes* or *Tones*, whether Greater or Leſſer: And none, whatſoever, have given any Light, or Hints about the other Nineteen *Adjuncts*, or Supplimental *Notes*, which are equally certain in Nature, with the other Five always taught; and ſome of the Nineteen frequently directed, and juſtly perform'd by the *Voice*, and on the *Violin*; as alſo on ſome fretted Inſtruments, when tuned to thoſe directed *Notes*, and divers of the Nineteen are of abſolute Uſe in cloſing on divers *Keys* or *Notes* of the common *Scale*: And now I ſhall proceed more directly toward the main Point I at firſt aim'd at in this Undertaking.

And Firſt, all Authors of any Note, who have written about the Grounds of Harmony, have agreed about the Diviſion of a ſingle *String*, or *Monochord*, to ſuch Number of equal Parts, as they have mention'd; and alſo, that thoſe very Parts ſhall produce ſuch *Notes* and *Relations* to the whole *String*, as they have ſeverally aſſign'd to each reſpectively; namely, That every *String*

divided

divided exactly in the middle, ſhall, in each half, give a true *Octave* to the whole *String*; and alſo, that the ſame *String*, divided into 3, 4, 5, 6, 8, 10, 12, &c. Parts, ſhall produce ſuch *Notes*, or *Tones*, as they have alſo affix'd to ſuch Part reſpectively; and they have thus proceeded, and ſeverally aſſign'd to each Part of the *String*, the *Note*, or *Tone*, it produces throughout the Compaſs of the Seven *Cardinal Notes* in an *Octave* incluſive; and ſome of them have advanc'd a little farther, as to ſcore out a ſeeming Method to diſcover ſome of the Five *Flats* and *Sharps* of the ſame *Octave*, but very obſcure and uncertain: However, had they been exactly right, and gone thro' all the Thirteen *Tones* or *Notes* of that *Octave*, they have not ſettled the Number for their firſt *Note* or *Foundation*, and then proceeded (as the aforeſaid the Honourable Mr. *Roberts* has done in his Method) to give the preciſe or near Number which ſhould conſtitute any of the other Eleven intermediate *Notes* in the ſaid *Scale* of Thirteen, as I ſhall do in my *Scale* of Thirty Two following; where the Reader is to obſerve, that the Eight *Cardinal Notes*, and their Five *Flats* and *Sharps* in One *Octave* incluſive, are diſtinguiſh'd by *Semibreves* thus 𝅝, and that the Nineteen additional *Notes*, *Adjuncts*, or *Suppliments*, are alſo diſtinguiſh'd by *Minums* thus 𝅗𝅥, or *Crotchets* thus ♩; and that the Number, which I apprehend, exactly, or very nearly, conſtitutes every One of the 125 *Notes* in the Four *Octaves*, from double *C* below (being 8000) to *C* in *Alt* above, (being 500) hath its Number under it, and to which I have alſo added a ſmall *Scale* of ſuch Parts for the upper *Octave* (from which the lower Three are generated) from *C* 1000 to its *Octave C* 500, the half thereof, with the Differences between each Two next *Notes*; which I now here preſent to the Reader's View and Examination, as a moſt perfect and Mathematical *Theory* and *Syſtem* of the *Gamut*, bringing in and comprehending all that hath been, by any Author, collected from the *Greeks* Three *Scales*, or *Moods* of Harmony, as I conceive, namely, *Diatonick*, *Chromatick*, and *Enharmonick*.

A TABLE of all the 125 *Notes*, *Adjuncts*, or *Suppliments*, in Four *Octaves* incluſive, from double *C* in the *Baſs* 8000, to *C* in *Alt* 500, equal Parts. Alſo a SCALE of like Parts, from 1000 to 500, applied to the upper of thoſe Four *Octaves*. *Plate the Firſt.*

BY the ſaid foregoing *Table* and *Scale* to the upper *Octave*, my Muſical Reader may plainly ſee the main End of my Deſign ſo far; and if he be duly qualify'd to judge of it, and without any Prejudice thereto, made by the ſtrong

Impreſſions of the ſtanding *Gamut* of Thirteen he has been long accuſtom'd to, I am perſwaded he will not think his Time and Thoughts thereon ill ſpent; and by this Method he may plainly ſee how reaſonably all *Notes* or *Tones*, with all their Relations in all the Three *Cliffs* and various *Keys*, are juſtly and harmonically provided for, diſtinguiſh'd, and differently Number'd and Proportion'd, not only in the Four *Octaves* before ſet down, but alſo for any other *Notes* which may be required either below double *C* 3coo, by doubling the Number of its *Octave* above it, or above *C* in *Alt*, by halving the Number of its *Octave* below it.

It is poſſible, that a nice Examiner may diſcover ſome ſmall Defect or Exceſs in ſome of the *Numbers* aſſign'd to ſome few of the *Notes* in this Table. I hope there are but few, and thoſe not exceeding one of the minuter Parts in the upper Line, being at firſt experimented on a ſhort Inſtrument, not Three Foot of Sound, with many different *Avocations*; and tho' there ſhould be more and greater Faults than, I truſt, will be found, I ſhall yet have the Satisfaction which my Friend Captain *Dantier* had in his more uſeful and noble Invention of his Map of Winds, *viz.* that, like him, I have chalk'd out a Plan for others that come after, to correct and build more nicely on; tho', as an ingenious Author has it, he that makes the Firſt Way thro' a thick Foreſt, deſerves better, and hath done more than he that makes it ſtrait afterwards.

The following Scheme, or *Regulating Table*, (*Plate* the 2d. *Table* 1.) which is fram'd with moſt ingenious Accuracy, for applying the foregoing Doctrine of the *Gamut* more particularly to the *Violin*, was communicated to me by the Honourable Compoſer of it.

It deſerves a much better Place and Company than it is fallen into, as every ingenious Examiner will ſoon diſcover, and that it needs no other Encomiums but itſelf, ſo expreſſive of its own Excellencies, and is as follows. *Plate* the 2d. *Table* 1.

It is calculated upon the Suppoſition, that the exact Diſtance between the *Nut* and the *Bridge* of a *Violin* is juſt Thirteen Inches, and alſo, that the Length of the Finger-board is ſomething more than Eight Inches, and to contain Forty Four diſtinct and different *Notes*, *Adjuncts*, or *Supplements* from the *Nut* toward the *Bridge*, on each of the Four *Strings*, with the very *Point* where to ſtop for either of the Forty Four on each *String*, to the Number of Inches, and hundredth part of an Inch, as in the laſt Column is expreſs'd; beginning at the *Nut* - 00, the *String* being open, and ending at Eight Inches, Fourteen Hundredth Parts, at the lower End of the Finger-board. *Plate* the 2d. *Table* 1.

In the same Plate, Table the 2d, is a Scheme contrived also by the same Honourable Person; and, indeed, far exceeding all Musical Schemes or Scales which have appear'd in *English*, or, I believe, in any other Language; and is properly call'd, a Musical *Compass* or *Index*, consisting of Two Parts; the under Part, which we may call the *Box*, and the upper Part (which is concentral with the *Box*, and moving on its Centre) may well be call'd an *Index*, the outer Circle of which contains Thirty One Columns of Numbers of the upper *Octave* of the foregoing First Plate, from *C* 1000:00 to *B* ♯ 511:30 round with the Sun; then into *C* again, 500 making the 32 *Notes* of the said *Octave* inclusive: The next inner Circle of 31 Columns, contains each particular *Note*, *Adjunct*, or *Suppliment* of the same *Octave*, by the initial, or first Letter, and the *Symbols* or *Characters* belonging to each, as *Flat b*, *Sharp* ♯, less *Flat* ♭, less *Sharp* +.

The Seven longer Points direct to the *Cardinal* Seven *Notes*, A, B, C, D, E, F, G, being that Scale call'd the *Diatonick*, and being the original and most simple of all; the Eleven next longest are supposed to point out the additional *Notes* to the said Seven, and together seem to make out the 2d *Scale* of the *Greeks*, call'd the *Chromatick Scale*; the lesser Thirteen Points seem, with the other Eighteen, to score or point out the 3d and last *Scale* of the *Greeks*, oft mention'd by Authors by the Name of the *Enharmonick Scale*.

The outer Circle of the *Index* hath also Thirty One Columns as aforesaid, answering to the same Number on the *Box*, Fourteen of which are number'd from the chief Point and Flower-de-luce 1000:00 to 534.69, under *Major* 7th.

One of the many good and easy Uses of this *Box* and *Index* is, at one View to see all the Musical Relations belonging to any whatsoever of the Thirty One different *Notes* of an *Octave*, whether common or extraordinary; One Example will fully explain this Use.

Suppose the Key to be *E b*, then turn the Flower-de-luce of the *Index* 1000:00 to *E b* on the *Box* 836.21, and keeping it fix'd; *Minor* 2d 935.14, of the *Index*, will point out *F b* on the *Box*, being 2d *Minor* to *E b*; *Major* 2d of *Index* points out *F* on the *Box* for 2d *Major*. *Minor* 3d of *Index*, to *G b* the 3d *Minor*; *Major* 3d of *Index*, to *G* the 3d *Major*; perfect 4th of *Index* to *A b* the perfect 4th to *E b*. *Major* 4th of *Index* to *A* the 4th *Major*. *Minor* 5th of *Index* to *A* + the 5th *Minor*. Perfect 5th of *Index* to *B b*, the 5th to *E b*. *Minor* 6th of *Index* to *C b* the 6th *Minor*. *Major* 6th of *Index* to *C* the 6th *Major*. *Minor* 7th of *Index* to *D b* the 7th *Minor*. *Major* 7th of *Index* to *D* the 7th *Major*, and then stands the Flower-de-luce to *E b* 500.00 the *Octave* of *E b* 1000.00, for the *Index Point* directs that the *Note* you choose for your

Key is to be reckon'd 1000. 00, and the several Relations to that *Key*, as *2ds*, *3ds*, *4ths*, *5ths*, *6ths*, and *7ths* of either Sort, consist of the respective Numbers, under those Relations on the *Index*. *Plate the 2d*, *Table the 2d*.

So much as this, and no more, I design'd at my first setting forth, but in my Progress making Discoveries and Observations, which I conceiv'd might prove not only new, but entertaining and improving likewise to a Harmonious Reader, I resolved to enlarge a little thereon.

The next Table I venture to call a Discovery, by Reason I have not met with any Thing like it in all my small Province, and which, in short, is as follows, namely, That the Remainder or Complement of a *String*, divided in any Musical Point, Part, or Proportion, gives another *Tone* or *Note*, exactly or nearly related in one Respect or other to the other Part of the same *String*; all which I have inserted in the following *Table* in Numbers and Letters of the upper *Octave* from C 1000 up to C in *Alt* 500 the *Octave* thereof above it, being Thirty Two Notes inclusive.

The Division of the upper *Octave* of the foregoing *Table*, containing 500 equal Parts from 1000 to 500 upwards, and Thirty Two *Notes*, *Adjuncts*, or *Supplements*, with the nearest Complement Number of each to 1000; Also the *Note* and nearest Relation most of them are to another. *Plate the 3d*, *Figure* 1.

This Table of Complements is entirely new for ought I have ever seen or heard of, and not only so, but which, I hope will prove both pleasing and edifying to my Harmonious Reader, who will consider the Relation here exhibited that is between the several Thirty One *Notes* in an *Octave* of a *Monochord* or single *String*, and the respective remaining Part or Complement *Note*, to each *Note*.

And I must here again crave his candid Allowances if in some of the remotest Complements, being the least generally known, I may have exceeded or fallen short by some few like Minute Parts in the upper *Octave*.

Having now drawn up in as plain and short a manner as I well could, all that I had to do or say, I conceiv'd, requisite for the full Information of any Thing relating to the most generally approv'd of Scale of Musick call'd *Gamut*, so long establish'd in the Musical and Learned Part of the World; I shall proceed toward a Conclusion, by saying something pertinent, I hope, on some of the foregoing Tables.

As to the first of them, *Plate the 1st*, I am perswaded, that no Person duly qualify'd, will deny the Truth of the main Point there laid down; namely, that there are in one *Octave* inclusive truly the 32 different and distinct

Notes, *Tones*, *Adjuncts*, or *Suppliments* therein ſet forth; fewer there are not; I dare not ſay there are not, or occaſionally may not be more.

And as to the reſpective Number of each Part of 8000, which ſtands aſſigned to each of the 32 *Notes* in each *Octave*; I do not inſiſt preciſely on each very Number, but deſire Allowance may be made for one, at moſt, ſuch Parts in ſome of them *Notes*, eſpecially of the 19 *Adjuncts* therein advanced, which ſtand diſtinguiſh'd from the 13 *Common Notes*, by a *Minum* thus 𝅗𝅥, or *Crotchet* thus ♩.

Some Readers who may allow the Truth of the Number 32, and alſo that the Number appropriated to each *Note* is not very erroneous; yet may both think, and ſay, *Ay!* but all this is for mere Speculation only, but is of ſmall or no Uſe in Practice.

To which I humbly anſwer, That this is of Uſe as well as for Speculation, ſince hereby the Scholar may be ſeaſonably caution'd and inform'd what he is to know, in order to make him an underſtanding Practitioner and Performer, not left to grope in the Dark for ſuch neceſſary Truths he muſt have Occaſion to be acquainted with, before he can be able either to perform, or ſpeak tolerably like a Maſter on the Subject of *Muſick*, or the *Scale*; and more eſpecially if *Vocal* Muſick, or the *Violins*, are his Profeſſion or Choice.

As to the Generality of other Inſtruments made with *Keys* or *Frets*, according to the uſual Way of 13 *Diviſions* or *Notes* in ſuch an *Octave*, however well made, prepared, fix'd, and tuned, ſtill the skill'd Performers on them well know the Deficiencies, the ſmall Defects, and Exceſſes of their Inſtruments (for want of theſe 19 *Supplimental* or *Adjunctive Notes*) in many *Keys*, *Flat* or *Sharp*, in *cromatick* Procedures, up or down, and in many *Cloſes* and *Cadences*, even in the common *Keys*; as I could moſt plainly Inſtance in various Caſes, could I in the leaſt apprehend the Thing doubtful.

Furthermore, the Makers of *Spinnets*, *Harpſichords*, &c. may, by this firſt Table, be aſſiſted in their proportioning the Lengths and Sizes of their *Strings* and *Bridges*, according to the Pitch and Compaſs they deſign; and adjuſting other Matters to the neareſt Proportion may be, and much improve the Patterns, Rules, Gauges, and Meaſures, they have learn'd from their Maſters, or others.

The *Organ*-builders may likewiſe receive much Light thereby, in framing their *Monochords* for the various Lengths of all their *Pipes* and *Tubes* for any *Stops*, or for any deſign'd *Pitch* or *Compaſs* whatſoever.

As to the *Violin* Table, *Plate the 2d*, *Number 1*, it is ſo plain, ſo juſt and inſtructive, moſt eſpecially to the Beginner, who deſires to know and pra-

dice to Perfection; that nothing need be ſaid more than is in the foregoing Explanation of it.

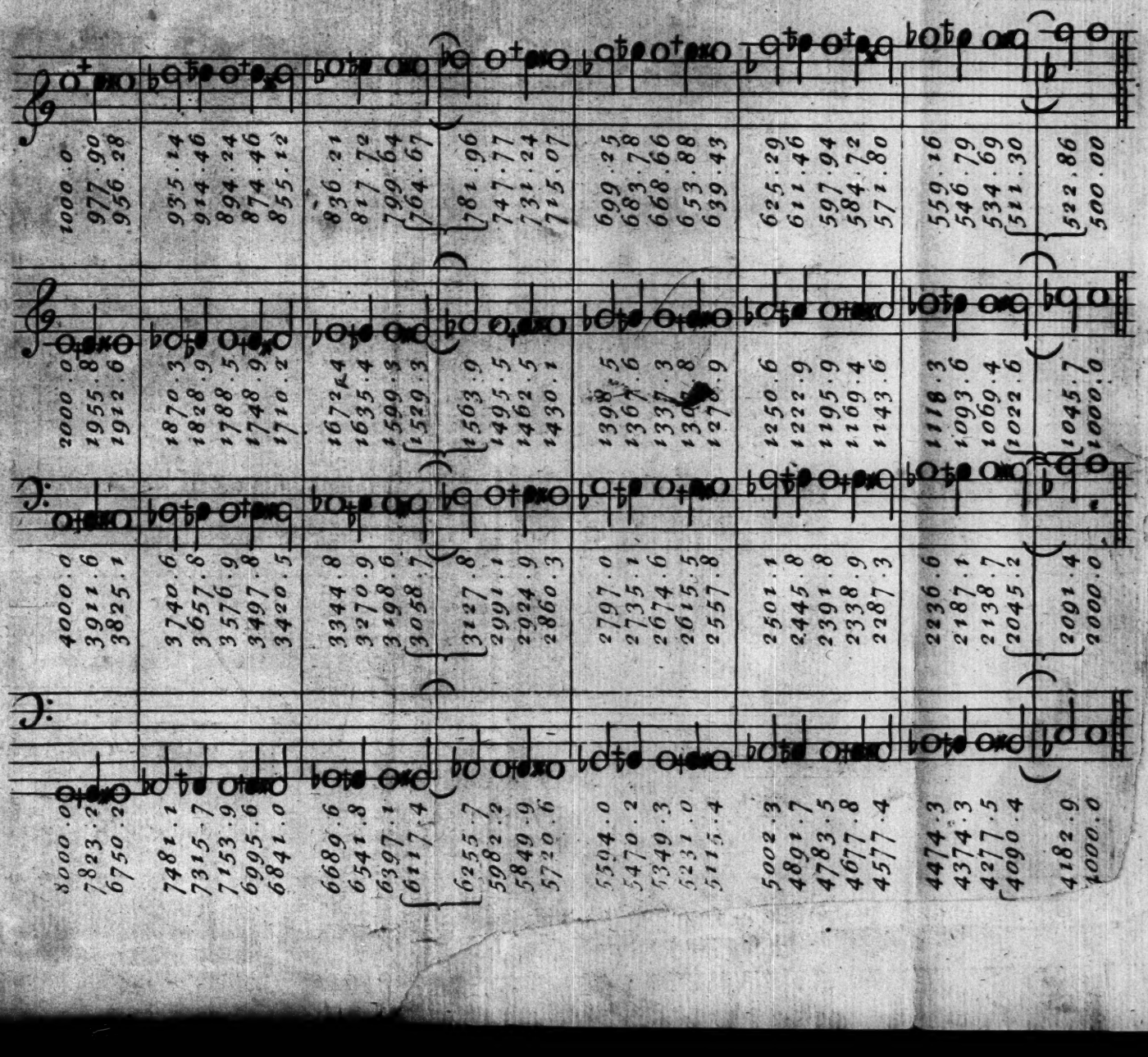
Then, as to the Muſical *Compaſs* and *Index*, *Table* 2*d*, in the ſame Plate, ſufficiently deſcrib'd and explain'd, *Page* 2; I ſhall only give the ſhort Sum Total of what all who have ſeen it, and were competent Judges, have declar'd, *viz.* That it is a wonderful ingenious Contrivance to bring ſo very many Things into ſo ſmall a Space, and ſo regular withall; and tho' it had happen'd not to be true in ſome Particulars, yet the Contrivance is admirable, and not to be equal'd in the whole Science of *Muſick*, yet diſcover'd in any Part of the Earth.

There is little to be ſaid more of the Complement *Table* than that it is new, and may poſſibly be not only much corrected, but alſo may help and diſcover ſomething in *Muſick*, or the *Monochord* only, that is yet undiſcover'd.

The laſt *Scheme*, *Fig.* 2, in the ſame *Plate*, is only the *Numbers* of the 32 *Notes*, *Adjuncts*, or *Suppliments* of the upper *Octave*, from *C* 1000-0000 to its *Octave C* 500-0000 each to the Ten Thouſandth part of Unity, to induce any Perſon, duly qualify'd, to examine the whole by Calculation.

I have good Hopes, that, in the preceeding Diſcourſe and Tables, all I intended or propos'd is truly, fully, and intelligibly explain'd, relating to the *Scale* of *Muſick* or *Gamut*, ſo univerſally known and approv'd of (for no more of the Muſical Science was intended by me); and this is done, I truſt, without any Neceſſaries being omitted for the full Information of a Muſical Capacity, and alſo, without any more Repetition than may prove uſeful to the End propoſed.

FINIS.

A Table of all the aforesaid 32 Notes, Adjuncts or Supplements, in 4 Octaves inclusive from 8000 to 500 Parts. Also a Scale from 1000 to 500 like proportional Parts, applyed to y^e upper of the 4 Octaves.

Note.	Number.	diff.
C	1000.0	22.10
c♯	977.90	21.62
D	956.28	21.14
d♭	935.14	20.68
d♯	914.46	20.22
E	894.24	19.78
e♭	874.46	19.34
e♯	855.12	18.91
F	836.21	18.49
f♭	817.72	18.08
f♯	799.64	17.68
G	781.96	17.29
g♭	764.67	16.90
g♯	747.77	16.53
A	731.24	16.17
a♭	715.07	15.82
a♯	699.25	15.47
B	683.78	15.12
b♭	668.66	14.78
b♯	653.88	14.45
C	639.43	14.14
c♯	625.29	13.83
D	611.46	13.52
d♭	597.94	13.22
d♯	584.72	12.92
E	571.80	12.64
e♭	559.16	12.37
e♯	546.79	12.10
F	534.69	11.83
f♭	522.86	11.56
f♯	511.30	11.30
G	500.00